

Moreover, there does not appear to be any practical, market-based reason to promote xDSL deployment in comparison to other high-speed access technologies. This is because neither xDSL nor any of the other technologies discussed above is perfectly suited to deliver high-speed Internet access to the mass consumer market.⁴⁹ In addition, it is not yet clear at what price high-speed Internet access services will obtain broad market acceptance.⁵⁰ Perhaps for these reasons, at any given time industry observers have different views about which of these systems is best-suited to meet mass consumer demand. Comcast believes that meeting the objective of Section 706 — the delivery of advanced communications capabilities to *all* Americans — will undoubtedly require a mixture of different technologies to accommodate different circumstances.⁵¹

⁴⁸(...continued)

Matter of Private Line Rate Structure and Volume Discount Practices, *Report and Order*, 97 F.C.C.2d 923, 945 (1984).

⁴⁹ To list a few of these difficulties: multiple xDSL services carried in a single cable sheath may interfere with each other and/or with accompanying voice telephone services; cable-delivered services allow multiple users to share the same bandwidth, which may affect throughput as subscribership increases; many wireless options encounter line-of-sight problems such as interference from buildings and trees; current satellite options such as DirecPC do not permit a direct consumer-to-satellite return path, and some satellite options may encounter unacceptable latencies in the context of real-time interactive services.

⁵⁰ For example, press reports indicate that Ameritech is pricing its xDSL service at approximately \$70 per month (although that may include a voice telephone service on the same line). Typical cable modem service costs less. For example, Time Warner's Roadrunner service in San Diego costs only \$45-\$50, while the Cox@Home service can be obtained for as low as \$29.95 per month. See C. Weinschenk, "Modems For The Masses," *tele.com* (December 1997) at 35 (chart: "San Diego Cable Modem Matchup"). See also Eisenach Testimony, *supra* note 26 ("We know the technologies work, but we know a lot less about robustness, costs, business models and — the most important factor of all, consumer willingness to pay.")

⁵¹ It seems quite likely, for example, that either satellite or terrestrial wireless systems (perhaps supplemented by a "wired" telephone return path) will be better suited to provide high-speed Internet access to extremely rural areas than either a telephone-based or cable-based "wired" system. See Dagget Testimony, *supra* note 43. In this regard, if existing wired backbone providers cannot economically serve highly rural portions of U S WEST's territory, it is hard to see how U S WEST could do so.

c. Petitioners Have Many Options For Entering The High-Speed Internet Access Market.

Petitioners have made no real effort to identify the various technologies (summarized briefly above) that they and others can use to deliver high-speed Internet access to consumers, much less any effort to assess the relative merits of those technologies from the perspective of cost, widespread availability, or technical suitability. Instead, Petitioners started from the assumption that xDSL technology is the most appropriate means to achieve the purpose of Section 706, and then focused on the (supposed) regulatory disincentives to xDSL deployment. The main focus of comments was on xDSL as well. In assessing the Petitions, however, the Commission should consider available alternatives prior to giving any serious consideration to the grant of what amounts to a waiver of two of the key pro-competitive provisions in the Act.

For example, nothing prohibits Petitioners from building cable or OVS systems and using them to deliver high-speed Internet access, both within and outside their regions.⁵² Similarly, nothing prohibits Petitioners from obtaining certain broadband spectrum and using it to deliver high-speed Internet access. Also, to the extent that television broadcast signals, either present or future, can be used to deliver high-speed Internet access, Petitioners are free to purchase over-the-air television stations. To Comcast's knowledge, however, none have made any effort to do so.

Moreover, under Section 271(g)(2) of the Act, since enactment of the 1996 Telecommunications Act, Petitioners have been free to offer interLATA Internet services using dedicated facilities to elementary and secondary schools. As far as Comcast is

⁵² The rules governing the operation of OVS systems are much less restrictive than the rules governing cable systems. Moreover, there are no current cost allocation rules regarding OVS. As Congress and the Commission found, these factors should make OVS an attractive entry vehicle for firms such as Petitioners.

aware, they have not done so — even though the text and legislative history of Section 706 suggests that these schools were a primary focus of Congressional concern.

In fact, Petitioners are all free to operate as combined CLECs/IXCs outside of their regions to sell an integrated xDSL/backbone service such as that for which they seek in-region authority here. None, however, has done so.⁵³ If none of the Petitioners has even tried to implement their (apparently) now-favored integrated xDSL/backbone service anywhere, despite having had the legal authority to do so for more than two years, this suggests that their basic approach may be flawed. On the other hand, it may suggest only that Petitioners themselves are aware of the difficulties in using unbundled loops and collocation to compete with an ILEC-offered xDSL service.⁵⁴

It is highly significant that Petitioners have not pursued any of these alternatives. Ameritech, for example, has been free since February 8, 1996, to deploy an integrated xDSL/backbone service from New York to Miami, from Houston to Atlanta, and elsewhere. And, under Section 271(g)(2), it could have linked that network to an in-region interLATA network integrating Internet access and backbone service dedicated to elementary and secondary schools — a network that could have been

⁵³ For example, while U S WEST has apparently pursued out-of-region backbone activities, it has not combined those activities with xDSL services delivered over (for example) unbundled local loops obtained from BellSouth, Ameritech or other ILECs.

⁵⁴ In this regard, while COVAD compellingly details its difficulties in obtaining xDSL-capable loops from Bell Atlantic, it appears to have had more success with Ameritech and Pacific Bell. See COVAD Comments at 8-11, 14; R. Barrett, "California Customers Love Their XDSL Service," *Inter@ctive Week* (February 16, 1998) at I-13. See also DSL Comments at 12-14; AT&T Comments (Bell Atlantic) at 16-19; Level 3 Comments at 11; *id.*, Exhibit A at 6; WorldCom Comments at 19-21, 36. If the real source of any problem with xDSL deployment is ILEC resistance to collocation and related requirements, then any Commission regulatory efforts to spur xDSL deployment should be directed to solving *that* problem, as opposed to granting special regulatory relief to the firms that are causing it. As one observer noted, "competition with the telcos' DSL initiatives will depend on the ability of [IXCs, CLECs and ISPs] to force unbundling of the telcos' services in a timely manner, so competitors can create their own service[s]." C. Carr, "DSL Gets Down To Business," *tele.com* (November 1997) at 44.

expanded after Ameritech was granted full interLATA authority. The other Petitioners have had similar opportunities (each with slightly different geographic configurations). Their decision not to more fully exploit these opportunities may simply indicate that (as noted above), under present rules, deploying xDSL service as a non-incumbent is more difficult than Petitioners imply.⁵⁵ At a minimum, however, it strongly suggests that their claimed interest in a regulatory environment that encourages the deployment of high-speed Internet access service may not reflect their actual business or regulatory goals.⁵⁶

3. The Commission Should Comprehensively Address Issues Of Access To Advanced Telecommunications Capabilities — Without Regard To Any Transmission Media Or Technology — In The Notice Of Inquiry Contemplated By Section 706

The discussion above shows that the issue of how best to deliver high-speed Internet access to consumers is complex. It is bigger than xDSL technology. It is bigger than ILECs, CLECs, and IXCs. It includes, at a minimum, telecommunications carriers, ISPs, cable television operators, broadcast and non-broadcast wireless operators, satellite service providers, analog and xDSL modem manufacturers, switch and router manufacturers, and computer, set-top box and television manufacturers.⁵⁷ It also includes software engineers and others whose innovations create more advanced data compression and streaming technologies, as well as improved Internet protocols

⁵⁵ See Ameritech Petition at 17-18; U S WEST Petition at 51-52.

⁵⁶ See, e.g. Level 3 Comments at 12; *id.*, Exhibit A at 6-8.

⁵⁷ It is not clear today whether consumers will prefer to obtain high-speed Internet access via their computers, via their televisions, via both, or via some hybrid device.

that — when implemented in the routers that switch Internet traffic — will facilitate the delivery of time-critical, high-bandwidth services over the Internet.⁵⁸

From this perspective, it is clear that the simplistic proposals in the Petitions — let the Petitioners into the interLATA Internet business, and give them control over local xDSL-based Internet service to a degree not permitted by Section 251(c) — will do little to address any "problem" with high-speed Internet access that might actually exist. As noted above, the market is plainly responding to the need for more raw "capacity" on the backbone, as well as to the other, subtle issues that may actually contribute more directly to data delivery delays.⁵⁹

More fundamentally, the effect of Petitioners' proposals would be to favor their particular technology. Indeed, Petitioners seem interested not only in favoring xDSL over other technologies; they appear to be interested in encouraging the development of xDSL technology in carrier-centric way, so that xDSL equipment is almost necessarily embedded in central office-based applications.⁶⁰ For these reasons, adopting Petitioners' proposals would not accelerate the overall deployment of high-speed Internet access service. Instead, such a course would inevitably deprive

⁵⁸ For example, new Internet protocols support the assignment of different priorities to different packets, depending upon whether the delivery of the packet is time-critical (*e.g.*, part of a video stream) or not (*e.g.*, part of an email message). *See, e.g.*, V. McCarthy, "The Year To Unlock The Internet," *Telephony* (December 15, 1997); C. Perey, "Learn From The IP Video Pros," *Network World* (October 20, 1997) at 57 ("The Resource Reservation Protocol (RSVP) provides a mechanism to reserve bandwidth for a particular end-to-end intranet or Internet-based session. It will address the bandwidth allocation need to some degree when it's phased into existing networks over the next few years.")

⁵⁹ *See, e.g.*, WorldCom Comments at 42-43; Intermedia Comments at 17.

⁶⁰ *See* F. Dawson, "GTE Plots Huge ADSL Rollout," *Multichannel News/Broadband Week* (March 23, 1998) at 47-48 (noting that U S WEST "has already announced plans to provision central offices serving 5.5 million lines"). *See also* "Random Access," *Inter@ctive Week* (February 16, 1998) at 25 ("Industry insiders say remote access equipment is headed for the central offices (COs) of telecommunications carriers.")

consumers of the benefits of a more robust array of market-driven alternatives for high-speed Internet access.

In these circumstances, the Commission should reject the Petitions not simply on "legal" grounds, but because they are wrong on technical and economic policy grounds. The Petitions misidentify both the nature and scope of the Internet access "problem," and the importance of Petitioners' own favored xDSL technology to the solution of any problem that might exist. Stated bluntly, the analysis in the Petitions is both carrier-centric and bandwidth-centric, when providing high-speed Internet access to "all Americans" involves much more than carriers and much more than bandwidth.

As described above, many different technologies are vying for consumer acceptance. Consequently, there will almost certainly be many different ways to meet Section 706's challenge to deliver high-speed Internet access to "all Americans." Each solution will involve different compromises among the fundamental elements of bandwidth, memory, and computing power. It is highly unlikely that one particular approach will ever be "best," given the continuous innovation in the relevant technical disciplines, as well as the vastly different situations of different consumers (*e.g.*, a dense suburb near a telephone company central office and a cable headend, vs. a highly rural ranch or farm). Instead, a mix of solutions will be required.

As a result, while the present Petitions should be dismissed, Comcast suggests that the Commission should initiate the inquiry called for by Section 706 in a timely fashion, consistent with the requirements of the law itself.⁶¹ The Commission should frame that inquiry broadly, and invite and encourage all relevant groups to participate. Such an inquiry will allow the Commission to develop a full and robust record that addresses all facets of the issue, and, therefore, will allow the Commission

⁶¹ Section 706 directs the Commission to begin the relevant Notice of Inquiry by August 8, 1998 and to complete it by February 7, 1999.

to fashion a regulatory response (if any is necessary) that effectively addresses any actual barriers to deployment that are found to exist.

4. Conclusion.

From both an economic and engineering perspective, the Internet is more complex than is apparent from the Petitions. When the more robust reality of the Internet is taken into account, the "problems" Petitioners identify do not seem to exist at all, and, to the extent that they do exist, there is no basis to think that Petitioners' proposed "solutions" would really address them.

As a result, the Commission should deny the pending Petitions. That denial, however, need not be based merely on a generic objection to Petitioners' providing interLATA services or competitive high-speed Internet access services. Instead, it can and should be based on the fact that the Petitioners have failed to appreciate the complexity of the Internet, and, therefore, have failed to prove their case.

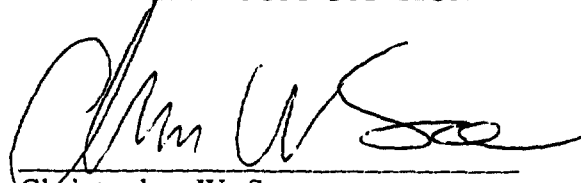
The Petitions nevertheless raise important policy issues. Section 706 — upon which this entire exercise depends — directs the Commission to conduct an inquiry "concerning the availability of advanced telecommunications capability to all Americans," in order to determine "whether advanced telecommunications capability is being deployed to all Americans in a reasonable and timely fashion." To fulfill this mandate in a thorough and responsible manner, the Commission must consider *all* facets of how the Internet can and will deliver high-speed services to consumers, including not only wired bandwidth provided by "telecommunications carriers" of various types, but also developments in router technology; caching technology; streaming and compression technologies; xDSL technologies; cable modem technology; wireless and satellite delivery technologies; and the pace and cost at which these various technologies are being integrated into end-user devices such as personal computers and "smart" set-top boxes. The understanding arising from such an inquiry — as opposed to the bandwidth-

centric focus of the present proceedings — will provide a sound basis for the Commission to determine whether any regulatory response is called for.

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